

Nature of Science

Thinking beyond observing

Definition?

ACTIVITY

Work in pairs

Collect an envelope with a series of statements related to Science and the nature of science

Rank the ideas from most important to least important with your partner

Have a discussion at your table to see if there is any consistency in your rankings



*Think back to your practicum:
What views do your students have
about the nature of science?*

What is Science?

Scientists pose, test, and revise hypotheses based on research outcomes.

Scientific ideas are developed through reasoning.

Science does not prove or conclude; science is always a work in progress.

Science corrects itself.

What is Science?

Science is a particular way of understanding the natural world.

It extends the intrinsic curiosity with which we are born.

It allows us to connect the past with the present, as with the redwoods depicted here.



What are the questions?

The astronaut picking up rocks on the moon, the nuclear physicist bombarding atoms, the marine biologist describing a newly discovered species, the paleontologist digging in promising strata... are all seeking to find out...?

A geologist comparing the effects of time on moon rocks to the effects of time on earth rocks, the nuclear physicist observing the behavior of particles, the marine biologist observing whales swimming, and the paleontologist studying the locomotion of an extinct dinosaur...?

Each of these scientists tries to reconstruct the histories of the objects of study. Whether these objects are rocks, elementary particles, marine organisms, or fossils, scientists are asking...

3 basic questions

What is there?

How does it work?

How did it come to be this way?

Nature of Science (NOS) or Nature of Technology (NOT)

The Nature of science and technology (NOST) looks
behind the scenes of science

Some use the word “stories” instead of
“explanations,” “theories,” or “hypotheses” in our
definition. It might be a bit shocking to think of
science as a kind of “storytelling,” because we are
accustomed to thinking about science as factual,
whereas storytelling sounds so... fictional.

The Greeks

People have always told stories to explain natural phenomena.

e.g., the ancient Greeks explained the daily rising and setting of the sun using the story of Apollo riding his fiery chariot across the sky, but nobody would call such stories “science” in the modern sense.

What is STSE Education?

s primary goals and interests are moral and political in nature.

attempts to re-couple science and values education.

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Possible approach to STSE

WHO?

WHAT?

WHERE?

WHEN

HOW?

WHERE?



Possible Inclusions

Social responsibility and social justice

Science and values

Political question to action

Global perspectives

Real-life situations

Economics

Ethics and decision making

A commitment to face controversy

Derek Hodson's Issues Based Method (p199, 2010)

Level 1: Appreciation of the impact science and technological change have on society and the recognition that science and technology are influenced by culture.

Level 2: Recognition that the interests of particular individuals or groups influence decisions about scientific and technological developments.

Level 3: Development of the student's personal views and values.

Level 4: The preparation for and moving to action.

Useful websites:

www.wn.com for news clips

<http://www.storyofstuff.com/>